Guest Article
October 2, 2024

Smart Contracts and the Future of Financial Instruments:

Timothy Spangler

A Practical Guide for Investment Advisers

Timothy Spangler, Partner, Practus LLP*

Today, the phrases "tokenization" and "real world assets" are hard for investment management professionals to avoid. It feels at times that merely opening a new PowerPoint file causes those terms to auto-populate any slide deck presentation on the future of the global funds industry. The purpose of this article is to unpack these unfortunately misdescriptive turns-of-phrase, which obscure more than they reveal, and focus on a more productive question – what will the role of smart contracts (and the blockchains they are built on) be in the next upgrade of financial market infrastructure?

Importantly, the concept of "smart contracts" precedes the launch of the first blockchain. Over a decade before Satoshi Nakamoto published his [groundbreaking 2008 white paper](#) proposing the structure and operation of bitcoin, Nick Szabo published his own papers on smart contracts,[i] which were initially envisioned as a new breed of computer programs that could be constructed to replicate and automate transactions that previously had required human intermediation and therefore the risk of non-performance.

Underlying bitcoin was the concept of a blockchain – a generational step-change in computer architecture – which would eventually provide an opportunity to develop and deploy smart contracts at scale. The launch of Ethereum in 2015 was soon followed by numerous other blockchains purpose-built for smart contract programming.

Upgrading the Financial Market Tech Stack

It quickly became clear that the ability to integrate smart contracts into the technology stack of our financial markets would eventually lead to disruptive changes in how stocks, bonds, and other securities are built, held, and traded. The benefits to investment advisers and their clients will be manifest across a number of fronts, including, for example, the speed, transparency, and cost-reduction in connection with the trading and real-time settlement of financial instruments.

Unfortunately, much of the terminology adopted to describe this technological evolution can be subject to ambiguity and misinterpretation. "Tokenization" fosters a fixation on the idea of a separate representation (or digital twin) for the legacy financial instrument. What is the relation of this new token to the share (or bond) we know and love? Similarly, "real world assets" encourages some to believe that blockchain has an ability to grant novel access to financial transactions in ways that avoid legal entities and securities laws.

A better way to envision the disruption currently unfolding around the investment management industry is simply that ownership records of financial instruments will increasingly make use of the on-chain record-keeping features and the peer-to-peer transactability of blockchains, specifically through computer programs that include smart contracts as part of their thousands and thousands of lines of code base.

Neither Smart, Nor Contracts

This is not to imply that the phrase "smart contract" is beyond its share of criticism. As Edward Felten, a Princeton computer science professor, observed in his 2017 article, smart contracts are neither "smart" nor "contracts."[ii] They are snippets of computer code that are compiled and run autonomously on networks of computers around the world that produce their results without human intervention. In the structure and operation of our financial markets, however, these smart contracts have the power to vastly increase the velocity, variety, and volume of securities, derivatives, and other more esoteric instruments that will comprise the clients' portfolios.

Currently, transactions in financial instruments require the intermediation of several trusted intermediaries in order to ensure that the desires and agreements of the ultimate buyers and sellers are respected. Each intermediary maintains its own internal records. Much time and

expense is incurred to ensure that the internal records of the next intermediary in the workflow are identical to the records of the last intermediary. When an error eventually occurs, these separate sets of records must be further examined and reconciled and updated where needed to resolve this error and better reflect the original agreement. Legal recourse and remedies from courts and regulators are available to forcibly impose the terms of such agreement when needed. Costs accrue relentlessly in these situations as a result.

Using smart contracts allows the creation and operation of trading platforms where this multitude of separate managed ledgers is replaced by a single ledger maintained on a blockchain that permits immediate updates and constant transparency. Every node on a blockchain will maintain and execute the same computer code to reflect the transfer of 100 shares of Acme Industries from Bob to Carol.

The role of computers in our financial markets has steadily increased over the past several decades. It is now quite unimaginable to consider removing them and reverting to our prior system of live traders and paper tickets. We are now entirely reliant on a patchwork of computer networks and proprietary software packages that are stitched together using telecommunication infrastructure that varies greatly in the efficiency and effectiveness of its various components. Our incumbent rails are ripe for replacement. Dig deep enough on the servers of our major financial institutions and you will find software several decades old written in the dusty COBOL language with a dwindling number of qualified repairmen available to service glitches.[iii]

But are smart contracts really up to the task of dragging investment management fully into the 21st century?

Tokens "Я" Us?

Much has been written previously on the use of blockchains to create tokens on protocols such as Ethereum's ERC-20 standard.[iv] These tokens first came to public prominence in the initial coin offering boom of 2017. The ease with which new digital assets could be created using Ethereum's native Solidity programming ledger led to a wave of thousands of new coins being created over the span of a few months. Most turned out to be follies with no lasting impact, and many became subject to investigations and prosecutions by the Securities and Exchange Commission. Regardless, the power of smart contracts was immediately evident and new blockchains were quickly launched to improve on the capabilities of Ethereum – including Cardano,[v] Solana,[vi] Cosmos,[vii] Polkadot,[viii] Avalanche[ix] and Internet Computer.[x]

Anything that can be recorded on a physical ledger in a leather-bound book or a computerized spreadsheet maintained on a desktop computer or server can also be maintained via smart contracts on a distributed ledger established and maintained on a blockchain. This could include the share registry of a Delaware corporation, bank loans, commercial or residential mortgages, swaps and other derivatives, leases, insurance policies and so on. Investment advisers holding these instruments in their portfolios will need to be familiar with how to interact with these decentralized software packages in order to buy, monitor, and sell such investments. What smart contracts add to this mix is the ability to automate transactions directly between market participants and remove the need for multiple levels of intermediaries and the cost in time, expense, and errors that they bring into the system.

It is important to bear in mind that despite their name, smart contracts are not meant to be, in and of themselves, replacements for actual legal contracts. They can be very effective at automating and disintermediating the exercise of rights created under binding agreements, but they are fundamentally no more or less than computer programs, whose precise legal status will evolve as they are deployed more deeply in financial markets workflows. As more value is built upon and stored within blockchain ledgers, the scope for smart contracts to effect transactions 24/7/365 with near-instantaneous settlement will continue to increase.

A Better Tomorrow

Much will continue to be written in the coming months about "decentralized exchanges" and "decentralized autonomous organizations," which in their own right will drive disruption. Yet their building blocks will remain smart contracts written in a variety of lesser-known computer programming languages such as Solidity, Rust, and Motoko.

Investment advisers have much to be optimistic about when looking out across the coming decade – despite the strong headwinds they are facing. Many of these challenges will drive adaptation and innovation, and many of the new products and services they provide to their clients (including the potential for 24/7/365 portfolio accessibility and a significant increase in the volume and velocity of financial instruments) will likely take advantage of the power of smart contract technology built on decentralized blockchains that span the globe.

[Timothy A. Spangler](#) is a partner at Practus LLP. He focuses his legal practice on the intersection of alternative investment management and financial technology innovations. He assists his clients with the formation, structuring and negotiation of private investment vehicles across numerous jurisdictions around the world. He regularly advises fund sponsors and promoters on the structuring and launch of hedge funds, private equity funds and venture capital funds, as well as with respect to their co-investment arrangements, internal partnerships and personal investments. He also advises clients on the impact of blockchain, cryptocurrencies and digital assets on the financial services industry and the innovation economy. Spangler can be reached at timothy.spangler@practus.com or (949) 810-8785.

The views and opinions expressed in this article are those of the author and do not necessarily reflect those of the IAA. This article is for general information purposes and is not intended to be and should not be taken as legal or other advice.

---

[i] The term "smart contract" first appeared in Nick Szabo, *Smart Contracts*, 1994, available at https://www.fon.hum.uva.nl/rob/Courses/InformationInSpeech/CDROM/Literature/LOTwinterschool2006/szabo.best.vwh.net/smart.contracts.html.

[ii] *See* https://freedom-to-tinker.com/2017/02/20/smart-contracts-neither-smart-not-contracts/.

[iii] For an interesting history of the role that the 65-year-old programming language still plays at many American banks, please see https://www.marketplace.org/shows/marketplace-tech/the-65-year-old-computer-system-at-the-heart-of-american-business/.

[iv] For a brief introduction to the ERC-20 standards for creating fungible tokens on the Ethereum blockchain, please see https://www.chainalysis.com/blog/introduction-to-erc-20-tokens/.

[v] *See* https://cardano.org/.

[vi] *See* https://solana.com/.

[vii] *See* https://cosmos.network/.

[viii] *See* https://polkadot.com/.

[ix] *See* https://www.avax.network/.

[x] *See* https://internetcomputer.org/.